**SNC2P – Gr 10 Applied Chemistry**

**Investigator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Background Story** |
| C:\Users\Aymeigh\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\HMX9EQRL\MC900431608[1].png You are one of Toronto’s rookie crime scene investigators and you have just been called in to examine the city’s newest homicide. Mrs. Woods was found dead in her kitchen with severe burns on her face and hands. She was a wealthy widow and evidence from the crime scene suggests that she may have been a victim of a home invasion and robbery.  Through an extensive survey of the crime scene, your colleagues have concluded that the person who committed the crime tried to cover up the evidence by using a common household product.  So far, a number of suspects have been rounded up from the neighbourhood and they all have traces of common household products on their clothes. However, the pH of the substance found on Mrs. Woods was tested Coincidentally, it matches the substance found in the trail of footprints made by the suspect. If the team can find out what this substance is, it will help narrow down the suspects!  Due to your expertise in identifying chemicals, you decide that this should be an easy task in determining the cause of Mrs. Woods’ death. If you can solve the murder, you will be promoted to a senior position, and obtain that raise you’ve been looking for! |

**In order to focus on the important aspects of the case, you decide to make some notes to refresh your memory of acids and bases.**

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| **Characteristics of Acids:**  **Characteristics of Bases:** | **Assign the following as either**  **acidic or basic characteristics:** |
| * Sour * Bitter * Corrosive * Slippery feel * Reacts with metals |

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|  | **Prediction** | **Observations** | **Color on pH Strip**  **And pH Value** | **Acid or Base?** |
| Acetic acid |  |  |  |  |
| Sodium Hypochlorite |  |  |  |  |
| Ammonia |  |  |  |  |
| Laundry Detergent |  |  |  |  |
| Carbonic acid |  |  |  |  |
| Magnesium Hydroxide |  |  |  |  |
| Shampoo |  |  |  |  |
| Citric Acid |  |  |  |  |
| Acetylsalicylic acid |  |  |  |  |

**Back at the lab, you decide to review the pH of some common household substances:**

**Remember the following procedures for testing pH:**

1. Label a cup with each for the liquids to be tested
2. Fill cup approximately ½ full with liquid to be tested. If substance is a powder or tablet, crush with mortar and pestle first, then add water.
3. Dip half the pH strip into the solution
4. Observe and record the colour.
5. Compare the colour with value of pH on pH chart.

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| **Your colleague took photos and collected the following evidence from crime scene:** |
| **C:\Users\Aymeigh\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\9RF5PPXH\MM900282788[1].gif**   1. Spilt vinegar on the kitchen counter and floor. 2. A spray bottle of glass cleaner with ammonia on the dinner table. 3. A bottle of milk of magnesia on a nearby bookshelf. 4. A box of baking soda on the stovetop. 5. A bottle of household lye under the kitchen sink. 6. A half empty bottle of bleach on the floor. 7. An empty bottle of laundry detergent in the closet. |

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| **Below are the suspects that were rounded up:** | | | | | |
|  | faces.png | faces.png | faces.png | faces.png | faces.png |
| **Substance**  **found on clothing** | Vinegar | Baking Soda | Milk of Magnesia | Laundry Detergent | Household Lye |

Who is the most likely suspect that killed Mrs. Woods?

Explain how you came to this conclusion using your analysis of the pH of.

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